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(56) Documents Cited

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(54) Abstract Title

Stereoscopic viewing apparatus which may be used as packaging for a compact disc

(57) Stereoscopic viewing apparatus assembled from a sheet of cut and scored cardboard or other suitable material. A mirror (18M) may be used within the apparatus in order to achieve a stereoscopic effect and the apparatus may be folded substantially flat for storage, mailing or other purposes. Such a stereoscopic viewing apparatus may also be designed to act as a packaging for a compact disc. A compact disc may fit into a hole (19H) which may have additional recesses in its circumference to permit access by the user's fingers. Complementary images (17A, 110A) may be provided on elements of the apparatus (17, 110) and where the apparatus includes compact discs, these the images may be printed on the compact discs.

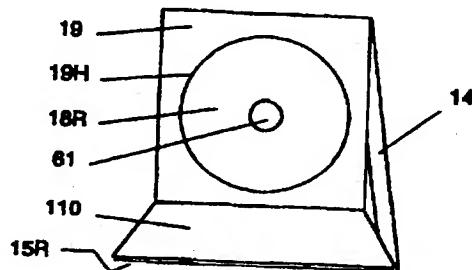


Fig 6

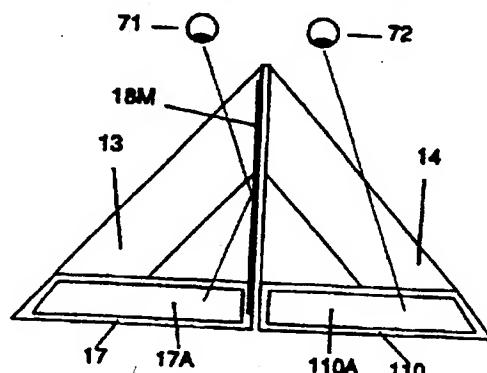


Fig 7

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**STEREOSCOPIC VIEWING APPARATUS AND THE SAME  
COMBINED WITH A PACK FOR COMPACT DISCS**

The invention comprises one or more forms of precut, prescored and optionally preprinted sheet made of cardboard or other suitable material, any of which forms may be assembled to make a stereoscopic viewing apparatus (stereo viewer). The invention also comprises modified forms of such sheets, any of which may be assembled to make a stereo viewer combined with a pack for one or more 'compact discs' (CDs). The invention further comprises methods whereby such sheets may be assembled to make stereo viewers or to make combined stereo viewers and packs for CDs. The invention also provides that when not in use the stereo viewer, or the combined stereo viewer and CD pack, can be folded substantially flat for storage, mailing or other purpose.

The method of functioning of the stereo viewer is explained fully in the reference to Figure 7 below.

Figures 1 to 4 show different forms of sheet for the above purposes. The thin lines between and within numbered elements indicate where a sheet should be scored and optionally folded. The thick straight lines indicate where cuts should be made within a sheet. The thick circular lines show examples of places where holes may be cut out of a sheet to facilitate use of its assembled form as a pack for one or more CDs. The width of the cuts (e.g. between elements 12 and 17 in Figure 1) may vary to some extent depending on the thickness of the sheet and on other factors. The nature of the scores for folding may also vary depending on the thickness of the sheet and the angle of the fold. For example, a fold of 180 degrees may be more conveniently performed by making two adjacent folds each of 90 degrees. The judgment of such variations is part of the art of persons skilled in cutting and folding paper and similar materials.

In the following description, a term such as 'the line 18/19' refers to a line between an element numbered 18 in a drawing and an adjacent element numbered 19. A term such as '12R' refers to the reverse side of an element numbered 12 in a drawing.

Figure 1 shows a form of sheet suitable for assembly into a simple stereo viewer. It consists essentially of ten elements numbered 11 to 110, two of which (11 and 16) are here shown as removed by cutting to make the finished stereo viewer easier to fold flat. If it is also desired to use the stereo viewer as a pack for one or more CDs, circular holes such as 19H may be cut in certain elements, for example in elements 19, 17 or 110. To assemble the stereo viewer, the following or similar steps may be performed.

1. Cuts are made as indicated by the thick straight lines.
2. The sheet is folded as indicated by the thin straight lines, other than those lines bisecting elements 13 and 14, where no fold is made. The folds between the numbered faces of elements are initially of 90 degrees, except along line 18/19 where the fold is of 360 degrees, i.e. elements 18 and 19 are back-to-back.
3. The reverse sides 18R and 19R of elements 18 and 19 are glued or otherwise fixed together.
4. At this or some other convenient time, a mirror (whose dimensions are no greater than those of element 18) is fixed to the surface of element 18 so as not to overlap it on any side.
5. The surface of element 12 is glued or otherwise fixed to the reverse side 17R of element 17.
6. The surface of element 15 is similarly fixed to the reverse side 110R of element 110. For clarity, one side each of elements 12 and 17 which will now be contiguous is shown by an asterisk, as are the corresponding sides of elements 15

and 110.

The assembly is now as shown in Figure 5. It can be seen that the elements numbered 13 and 14 act as struts to hold the mirror 18M at or approximately at right angles to elements 17 and 110.

Figure 2 shows an alternative form of precut and prescored sheet similar to that shown in Figure 1, subject to the following differences in assembly.

1. Elements 22 and 25 are fixed back-to-back.
2. The surface of element 27 is fixed to the reverse side 28R of element 28.
3. The surface of element 210 is fixed to the reverse side 29R of element 29.

The assembly is now essentially similar to that shown in Figure 5.

Figure 3 shows a sheet consisting of fourteen elements numbered 31 to 314, two of which (31 and 36) are here shown as removed by cutting to make the finished stereo viewer easier to fold flat. This sheet and the sheet shown in Figure 4 are intended to function both as stereo viewer and as CD pack when assembled. As will appear later, the present invention allows great flexibility in these functions, and the precise positioning in Figures 3 and 4 of holes similar to 19H (in Figure 1) and 25H (in Figure 2) is best decided in the light of subsequent comments on Figures 8 and 9. To assemble the combined stereo viewer and CD pack, the following or similar steps may be performed.

1. Cuts are made as indicated by the thick straight lines.
2. The sheet is folded as indicated by the thin straight lines, other than those lines bisecting elements 33 and 34, where no fold is made. The folds between the numbered faces of elements are initially of 90 degrees, except along line 38/39 where the fold is of

360 degrees, i.e. elements 38 and 39 are back-to-back, and along lines 411/412 and 413/414, where the fold is of 0 degrees, i.e. elements 411 and 412 are face-to-face, and elements 413 and 414 are face-to-face.

3. The reverse sides 38R and 39R of elements 38 and 39 are then glued or otherwise fixed together, as are the surfaces of elements 411 and 412 and the surfaces of elements 413 and 414. 4. At this or some other convenient time, a mirror (whose dimensions are no greater than those of element 38) is fixed to the surface of element 38 so as not to overlap it on any side.

5. The surface of element 32 is glued or otherwise fixed to the reverse side 37R of element 37.

6. The surface of element 35 is similarly fixed to the reverse side 310R of element 310. For clarity, one side each of elements 32 and 37 which will now be contiguous is shown by an asterisk, as are the corresponding sides of elements 35 and 310.

The assembly is now as shown in Figure 8. As previously seen in Figure 5, the elements here numbered 33 and 34 act as struts to hold the mirror 38M at or approximately at right angles to elements 37 and 310.

Figure 4 shows an alternative form of precut and prescored sheet similar to that shown in Figure 3, subject to the following differences in assembly.

1. Elements 42 and 45 are fixed back-to-back.
2. Elements 411 and 412 are fixed face-to-face, as are elements 413 and 414.
3. The surface of element 47 is fixed to the reverse side 48R of element 48.
4. The surface of element 410 is fixed to the reverse side 49R of element 49.

The assembly is now somewhat different from that shown in Figure 8. However, the assembly deriving from the sheet shown in Figure 3 is an embodiment of the

invention which is preferred to that deriving from the sheet shown in Figure 4, which will not be described further. The differences between the two assemblies will be clear to persons skilled in the art of cutting and folding paper and similar materials.

Figure 5, as discussed earlier, shows the assembled stereo viewer derived from the sheet shown in Figure 1 and (approximately) that derived from the sheet shown in Figure 2. It may be folded for closure in a manner similar to that described in the discussion of Figure 10 below.

Figure 6 shows the same assembled stereo viewer as in Figure 5, designed to perform the additional function of a pack for a single CD. Such CD would fit in the hole 19H, which may have additional recesses (not shown) in its circumference to permit access by the user's fingers to the rim of the CD. A suitable retainer 61 engaging the central hole of the CD may be fixed to the reverse side 18R of the element 18 to which the mirror is attached. If desired, similar holes might be made in elements 17 or 110 in Figure 5, with similar retainers fixed to elements 12 or 15.

Figure 7, from a viewpoint distal from the user of the stereo viewer, shows schematically the principle on which the present invention works.

Humans perceive the world as three-dimensional partly because their two eyes see the same scene from slightly different points of view and present slightly different but complementary images to the optical centres of their brains. These complementary images are combined in the mind and interpreted as a single view of a three-dimensional world.

If two such complementary images are presented to a person's two eyes, that person will have the impression of viewing in three dimensions the original scene from which the two images are derived. The two images are then said to be stereoscopic and the person is said to be viewing them stereoscopically.

The type of apparatus on which this invention is based uses a mirror to reflect one of the complementary images to one eye, while the other eye sees the other image directly. The image chosen to be reflected is reversed left to right, this reversed image being again reversed by being reflected in the mirror. The complementary images are thus presented correctly to the two eyes.

In Figure 7, the user's right and left eyes are represented as 71 and 72 respectively. The left eye 72 views one complementary image 110A directly. The other complementary image 17A is reversed and is viewed via the mirror 18M, by which it is again reversed and thus presented correctly to the user's right eye 71. The two images therefore combine stereoscopically in the user's mind and the user has the impression of a single view seen in three dimensions. (It is assumed here that image 110A will be viewed directly by the user's left eye, and that image 17A will be reversed and viewed via the mirror by the user's right eye, but the opposite could equally well be true.)

In practice pairs of complementary images may be printed or otherwise carried on the elements 17 and 110, or they may be carried on separate sheets such as, for example, the leaves of one or more books. In one embodiment of the invention they may be printed on two CDs, each CD being carried by a hole and a retaining device similar to those numbered 19H and 61 in Figure 6.

Figure 8 shows the assembled apparatus whose derivation from the sheet shown in Figure 3 was described earlier. It can be seen that in addition to the possibility of carrying a CD on the reverse side 38R of element 38 in a similar way to that shown in Figure 6, Figure 8 shows four further surfaces available which may carry CDs, namely those numbered 37, 310, 312R and 313R, while two of these surfaces may carry stereoscopic images, namely those numbered 37 and 310.

Figure 9 shows the apparatus partly folded for closure, with the surfaces numbered 312R and 313R folded face-to-face with elements 37 and 310 respectively. It can be seen that surfaces 311R and 314R are now available to carry stereoscopic images. Alternatively they may carry CDs (which also may carry stereoscopic images), subject to the consideration that holes for CDs should not be made in two conjoined thicknesses of material such as those numbered 311 and 312.

Figure 10 shows a further stage in the closure of the apparatus. It can be seen that as one image-carrying 'wing' of the apparatus is folded towards or into the plane of the mirror 38M, the struts 33 and 34 should simultaneously fold into the space between the image-carrying wing and the mirror. Reference has previously been made to the necessity for judgment in cutting and scoring the sheets shown in Figures 1 to 4, and such judgment is here needed to ensure a good closure of the apparatus despite the several thicknesses of similar or different materials which may be involved.

**CLAIMS**

1. Stereoscopic viewing apparatus assembled from a cut and scored sheet of cardboard or other material.
2. Stereoscopic viewing apparatus assembled from a cut and scored sheet of cardboard or other material and using one or more mirrors to achieve a stereoscopic effect.
3. Stereoscopic viewing apparatus as claimed in Claim 1 which can be folded substantially flat.
4. Stereoscopic viewing apparatus as claimed in Claim 2 which can be folded substantially flat.
5. Combined stereoscopic viewing apparatus and package to hold one or more compact discs (CDs), assembled from a cut and scored sheet of cardboard or other material.
6. Combined stereoscopic viewing apparatus and package to hold one or more compact discs (CDs), assembled from a cut and scored sheet of cardboard or other material and using one or more mirrors to achieve a stereoscopic effect.
7. Combined stereoscopic viewing apparatus and package to hold one or more compact discs (CDs) as claimed in Claim 5 which can be folded substantially flat.

8. Combined stereoscopic viewing apparatus and package to hold one or more compact discs (CDs) as claimed in Claim 6 which can be folded substantially flat.
9. Stereoscopic viewing apparatus substantially as described herein with reference to Figures 1 to 10 of the accompanying drawings.
10. Combined stereoscopic viewing apparatus and package to hold one or more compact discs (CDs) substantially as described herein with reference to Figures 1 to 10 of the accompanying drawings.
11. The method of constructing and assembling stereoscopic viewing apparatus substantially as described herein with reference to Figures 1 to 10 of the accompanying drawings.
12. The method of constructing and assembling a combined stereoscopic viewing apparatus and package to hold one or more compact discs (CDs) substantially as described herein with reference to Figures 1 to 10 of the accompanying drawings.
13. The method of cutting and scoring sheets of cardboard or other suitable material for the assembly of stereoscopic viewing apparatus, or for the assembly of a combined stereoscopic viewing apparatus and package to hold one or more compact discs (CDs), substantially as described herein with reference to Figures 1 to 4 of the accompanying drawings.



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Application No: GB 9726757.9  
Claims searched: 1-13

Examiner: Caroline Marshall  
Date of search: 8 February 1999

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK CI (Ed.Q): G2J (J16B); B8P (PP)

Int CI (Ed.6): G02B

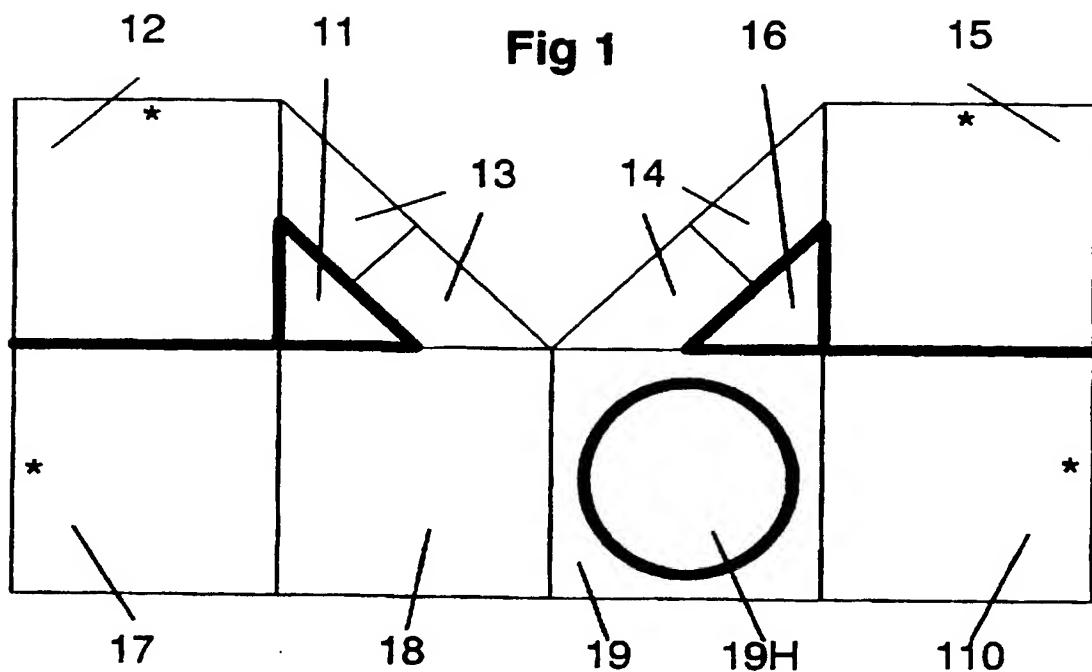
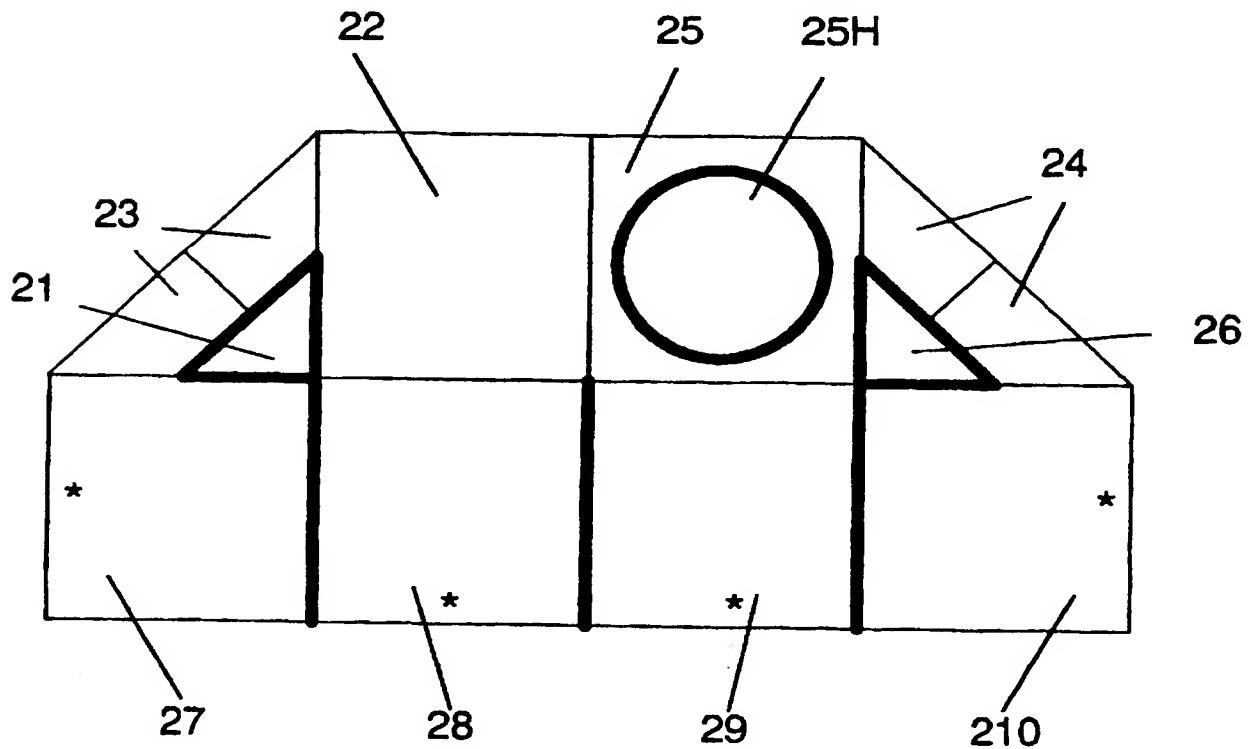
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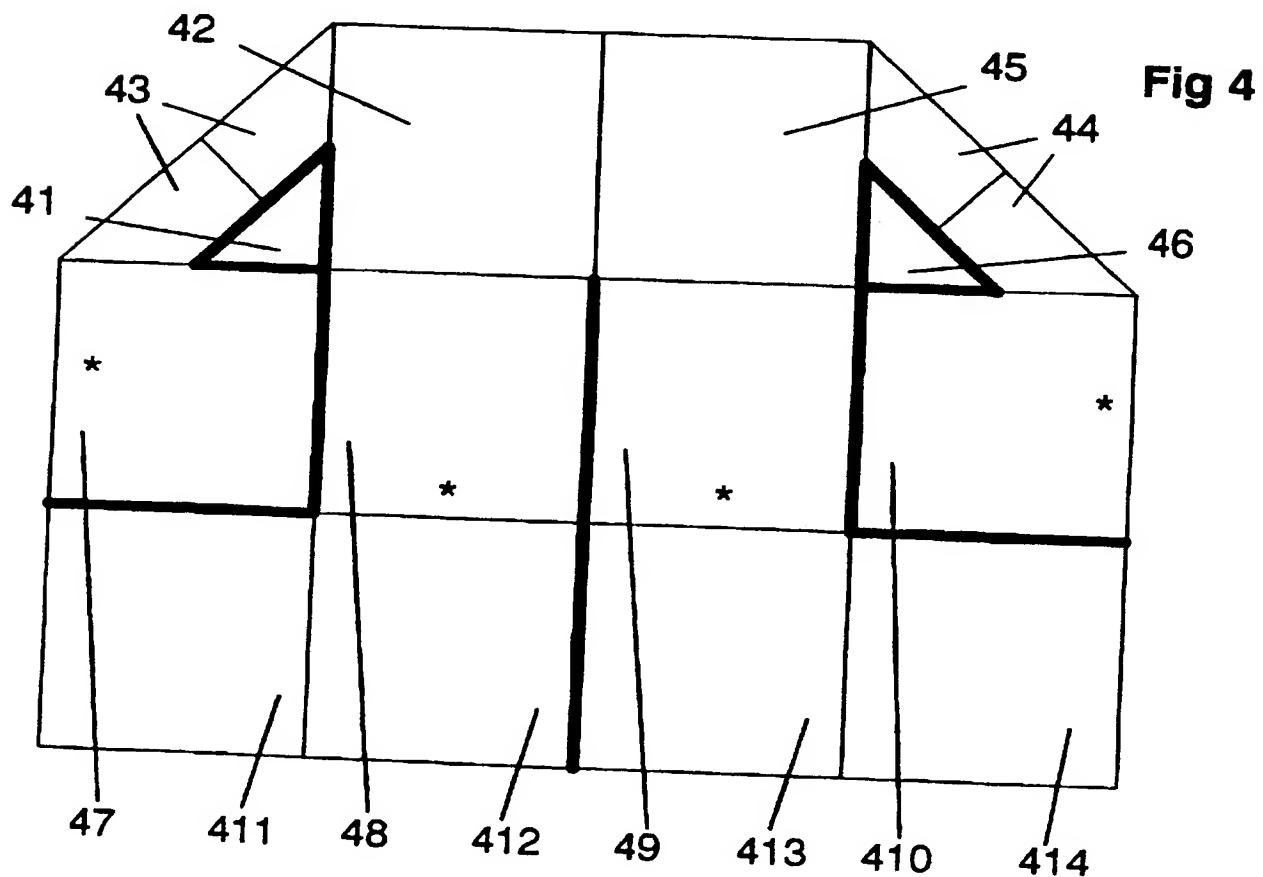
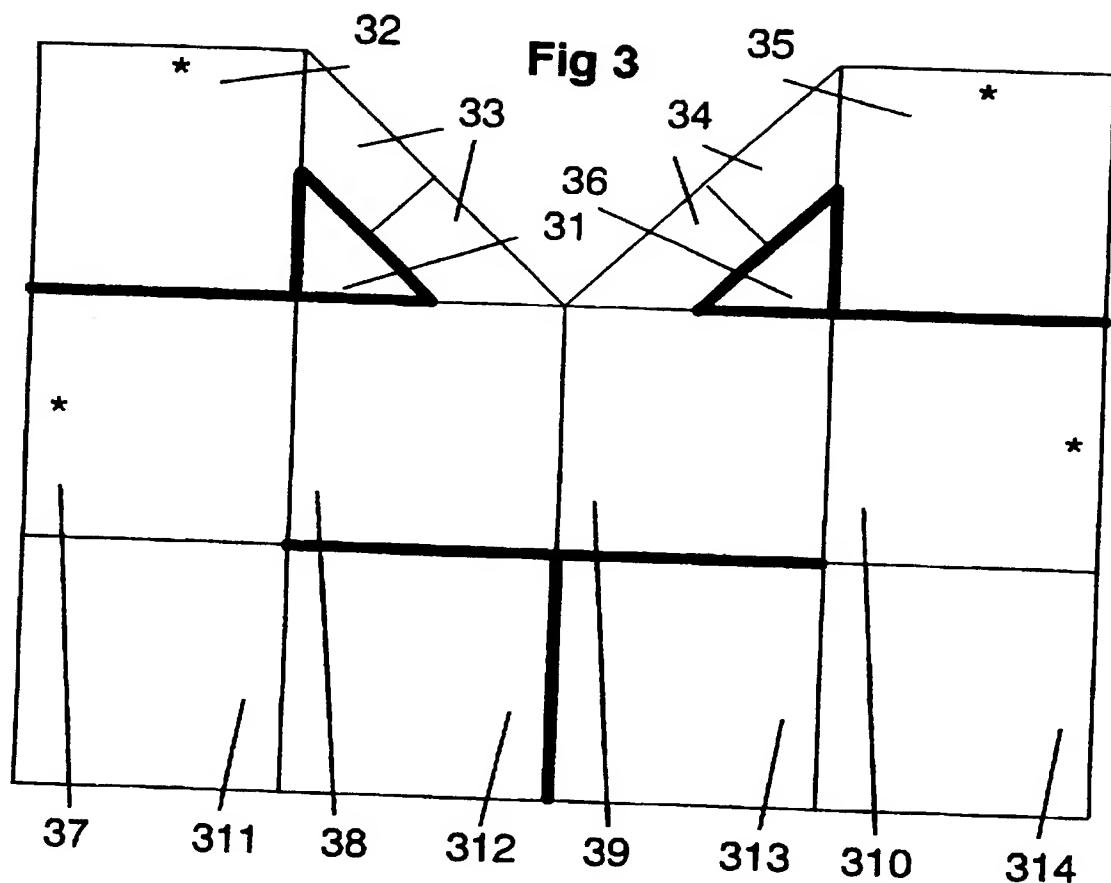
**Documents considered to be relevant:**

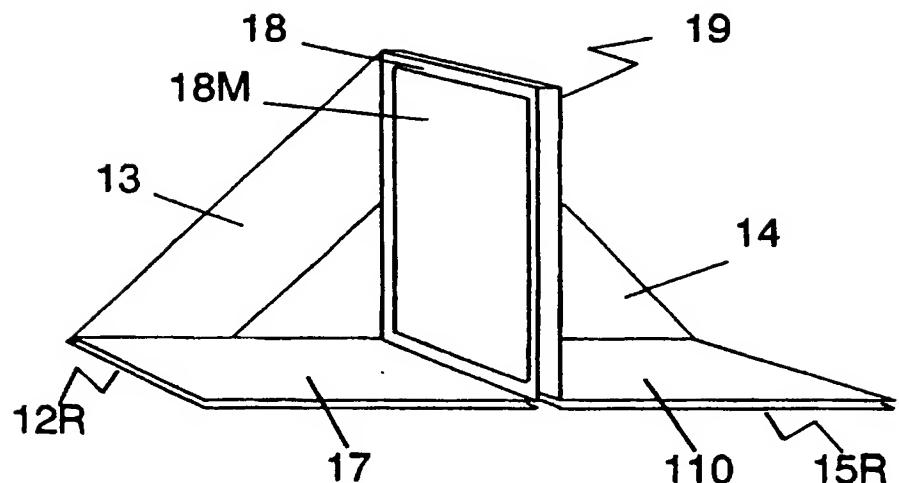
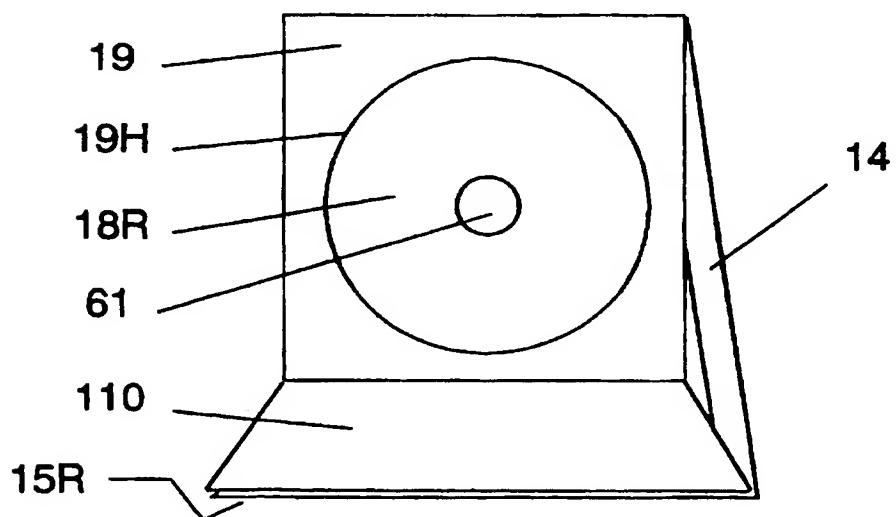
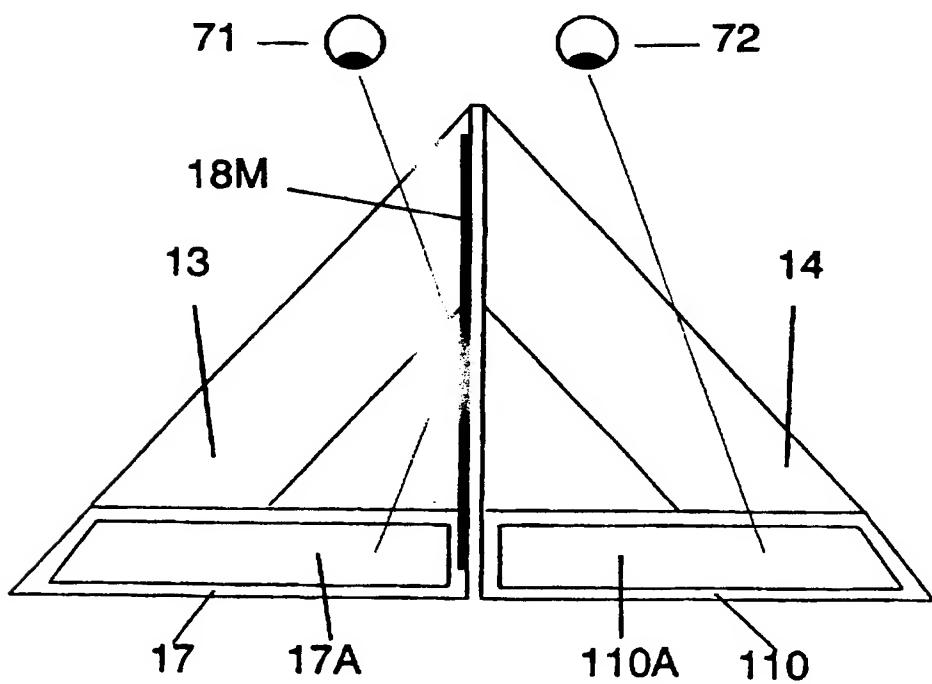
Category	Identity of document and relevant passage		Relevant to claims
Y	WO 96/31797	(Kabus) - see whole document, especially figs. 1-3.	2, 4, 6 and 8
Y	JP 5040242	(Tanaka Hiroji) - see the abstract and the fig.	5 and 7
X, Y	US 3 734 596	(Gunter) - see whole document, especially lines 4-13, col. 2 and figs. 1 and 3.	X: 1 and 3 Y: 2 and 4-8
X, Y	US 3 391 971	(Kaufman) - see whole document, especially lines 9-17, col. 2.	X: 1 and 3 Y: 2 and 4-8

X Document indicating lack of novelty or inventive step  
Y Document indicating lack of inventive step if combined with one or more other documents of same category.  
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A Document indicating technological background and/or state of the art.  
P Document published on or after the declared priority date but before the filing date of this invention.  
E Patent document published on or after, but with priority date earlier than, the filing date of this application.

**Fig 1****Fig 2**



**Fig 5****Fig 6****Fig 7**

